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### REMARKS

Claims 1-32 are in the case, and claims 1-10, 21, and 32 are removed from consideration. The drawings and specification are objected to. Claims 11-20 and 22-31 are rejected under 35 USC 112. Claims 11, 17-18, 20, 22, 28-29, and 31 are rejected under 35 USC 102 over USPN 6,198,635 to Shenoy et al., and claims 12-16, 19, 23-27, and 30 are rejected under 35 USC 103 over Shenoy et al. Claims 11 and 22 are hereby amended, and claims 13 and 24 are hereby cancelled. No new matter has been introduced by the amendments, which are supported by the disclosure of the original claims and the specification. Reconsideration and allowance of the claims are requested.

### DRAWING OBJECTIONS

The drawings are objected to because, it is written, they do not include reference signs for the via holes. Applicants respectfully traverse the objections. Applicants note that the term "via hole" is not used in either the specification or the claims, but rather the term "via" is used. Applicants direct the examiner's attention to vias 32 as depicted and labeled in figures 2-5 and 7-9, and further note that the reference number 32 is used in association with the term "via" throughout the specification. Therefore, reference signs for the vias 32 are included in the figures. Reconsideration is respectfully requested.

It is noted that because of the relatively large number of contacts 22, 24, and 26 and vias 32, it takes some effort (but not undue effort) to determine which of the elements are contacts and which of the elements are vias. However, this effort is only required in figures 2 and 7, where both contacts and vias are depicted. As described in the specification and labeled in the figures, only contacts (not vias) are depicted in figures 1 and 6, and only vias (not contacts) are depicted in figures 2-5 and 7-10. Thus, while every single contact and via cannot be individually labeled, there should be no confusion as to what is depicted in the figures or referenced in the specification.

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**SPECIFICATION OBJECTIONS**

The specification is objected to because, it is written, the via holes as described in the specification are not identified in the figures. Applicants respectfully traverse the objection. Applicants note that the term "via hole" is not used in either the specification or the claims, but rather the term "via" is used. Applicants direct the examiner's attention to vias 32 as depicted and labeled in figures 2-5 and 7-9, and further note that the reference number 32 is used in association with the term "via" throughout the specification. Therefore, reference signs for the vias 32 are included in the figures. Reconsideration is respectfully requested.

**CLAIM REJECTIONS UNDER §112**

Claims 11-20 and 22-31 are rejected under 35 USC 112 second paragraph because, it is written, the vias mentioned in the claims are not identified in the figures. Applicants respectfully traverse the rejections. Applicants note that the term "via hole" is not used in either the specification or the claims, but rather the term "via" is used. Applicants direct the examiner's attention to vias 32 as depicted and labeled in figures 2-5 and 7-9, and further note that the reference number 32 is used in association with the term "via" throughout the specification. Therefore, reference signs for the vias 32 are included in the figures. Reconsideration is respectfully requested.

**CLAIM REJECTIONS UNDER §102**

Claims 11, 17-18, 20, 22, 28-29, and 31 are rejected under 35 USC 102 as being unpatentable over Shenoy et al. Independent claim 11 as amended claims, *inter alia*, a printed circuit board having a contact array, with a major vertical routing channel that does not extend completely through the contact array and a major horizontal routing channel that does not extend completely through the contact array, where the major vertical routing channel intersects with the major horizontal routing channel. Shenoy et al. do not describe such an apparatus.

First, Shenoy et al. only describe a channel that extends in one direction through the interconnection array, as depicted in Fig. 4, whereas the present invention as claimed in

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claim 11 describes routing channels in more than one direction. The office action states that it would have been obvious to one having ordinary skill in the art to provide the circuit board of Shenoy et al. with multiple channels in horizontal and vertical directions, but there is no support for such an assertion, and such a modification would likely destroy the symmetry and layout of the array of Shenoy et al. Second, Shenoy et al. describe a channel that extends completely through the interconnection array, whereas the present invention as claimed in claim 11 describes routing channels that do not extend completely through the contact array.

Thus, claim 11 patentably defines over Shenoy et al. Reconsideration and allowance of claim 11 are respectfully requested. Dependent claims 17-18 and 20 depend from independent claim 11, and contain additional important aspects of the invention. Therefore, dependent claims 17-18 and 20 patentably define over Shenoy et al. Reconsideration and allowance of dependent claims 17-18 and 20 are respectfully requested.

Similar to that as described above in regard to independent claim 11, independent claim 22 as amended claims, *inter alia*, an integrated circuit package substrate having a contact array, with a major vertical routing channel that does not extend completely through the contact array and a major horizontal routing channel that does not extend completely through the contact array, where the major vertical routing channel intersects with the major horizontal routing channel. As described at length above in regard to claim 11, Shenoy et al. do not describe such an apparatus.

Thus, claim 22 patentably defines over Shenoy et al. Reconsideration and allowance of claim 22 are respectfully requested. Dependent claims 28-29 and 31 depend from independent claim 22, and contain additional important aspects of the invention. Therefore, dependent claims 28-29 and 31 patentably define over Shenoy et al. Reconsideration and allowance of dependent claims 28-29 and 31 are respectfully requested.

#### CLAIM REJECTIONS UNDER §103

Claims 12-16, 19, 23-27, and 30 are rejected under 35 USC 103(a) as being unpatentable over Shenoy et al. Dependent claims 13 and 24 are hereby cancelled. Dependent claims 12, 14-16, and 19 depend from independent claim 11, and thereby claim, *inter alia*, a printed circuit board having a contact array, with a major vertical routing channel

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that does not extend completely through the contact array and a major horizontal routing channel that does not extend completely through the contact array, where the major vertical routing channel intersects with the major horizontal routing channel. Shenoy et al. do not describe such an apparatus.

The deficiencies of Shenoy et al. in regard to these limitations are described at length above. Therefore, dependent claims 12, 14-16, and 19 patentably define over Shenoy et al. Reconsideration and allowance of dependent claims 12, 14-16, and 19 are respectfully requested.

Dependent claims 23, 25-27, and 30 depend from independent claim 22, and thereby claim, *inter alia*, an integrated circuit package substrate having a contact array, with a major vertical routing channel that does not extend completely through the contact array and a major horizontal routing channel that does not extend completely through the contact array, where the major vertical routing channel intersects with the major horizontal routing channel. Shenoy et al. do not describe such an apparatus.

The deficiencies of Shenoy et al. in regard to these limitations are described at length above. Therefore, dependent claims 23, 25-27, and 30 patentably define over Shenoy et al. Reconsideration and allowance of dependent claims 23, 25-27, and 30 are respectfully requested.

#### CONCLUSION

Applicants assert that the claims of the present application patentably define over the prior art made of record and not relied upon for the same reasons as given above. Applicants respectfully submit that a full and complete response to the office action is provided herein, and that the application is now fully in condition for allowance. Action in accordance therewith is respectfully requested.

In the event this response is not timely filed, applicants hereby petition for the appropriate extension of time and request that the fee for the extension be charged to deposit account 12-2355. If other fees are required by this amendment, such as fees for additional claims, such fees may be charged to deposit account 12-2252. Should the examiner require


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further clarification of the invention, it is requested that he contact the undersigned before issuing the next office action.

Sincerely,

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By:



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